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MACKENZIE VALLEY PIPELINE INQUIRY

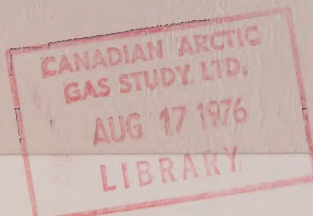
Phase IV
PANEL 3

EMPLOYMENT

WITNESSES:

1. Mr. Wayne B. Trusty
"Estimates of Total Direct and Indirect Employment that will be Generated by the Canadian Arctic Gas Project"
2. Mr. G. L. Williams
"Nature of Employment Opportunities during Construction"
3. Mr. F. T. Hollands
"Arctic Gas Employment Policies and Programs during Construction"
4. Mr. M. E. Carlson
"Nature of Operations and Maintenance Employment"
5. Mr. F. I. Hollands
"Arctic Gas Programs and Policies during Operations and Maintenance Phase"

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PANEL 3

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TAB

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ESTIMATES OF TOTAL DIRECT AND INDIRECT
EMPLOYMENT THAT WILL BE GENERATED BY
THE CANADIAN ARCTIC GAS PROJECT

by

W.B. Trusty

Presented to

Mackenzie Valley

Pipeline Inquiry

ESTIMATES OF TOTAL DIRECT AND INDIRECT
EMPLOYMENT THAT WILL BE GENERATED BY
THE CANADIAN ARCTIC GAS PROJECT

To provide a backdrop for this panel's testimony on employment opportunities and policies, I would like to briefly review some of the employment estimates presented in Section 14.c.

Before turning to the estimates, there are a couple of points that should be noted. During the course of the Arctic Gas testimony we will be presenting various estimates of direct, indirect, and induced employment: sometimes with reference to the entire region and at other times with reference to a specific function or locale. As you will appreciate, there have been changes in these estimates over time as planning with respect to particular functions or locations has become more detailed. In preparing this testimony, we have attempted to use the estimates that will best serve the purposes of the inquiry without leading you into a hopeless tangle of statistics.

For example, the figures that I am about to present include estimates of man-years of employment in transportation as a result of the project. At a later stage we will present more detailed figures on the number of jobs associated with the staging activities in the Hay River area. While there is considerable overlap between these two sets of figures, the units of measure are different, the method of categorizing is different, and the numbers for Hay River reflect recent, more detailed planning efforts and

take in a broader scope of activities than did the earlier estimates. When we are talking specifically about the nature and level of activity in the Hay River area, we will use the more detailed and precise figures. However, at this stage when we are simply trying to establish the order of magnitude of total employment as a backdrop for other testimony, the figures from 14.c are sufficiently accurate.

The employment estimates in Section 14.c are subdivided into three categories -- primary direct employment, primary indirect employment, and induced or secondary employment. Since the estimates were compiled from the perspective of the pipeline company, the primary direct category is restricted to jobs generated in the construction and operation of the pipeline and associated pipeline facilities such as compressor stations. The primary indirect category includes jobs in exploration, gas field development, gas plant construction and operations, transportation and equipment storage and supply. Secondary employment includes jobs generated in other sectors of the economy as a result of the multiplier effect of increased spending by persons in the primary employment categories.

At this point, I am going to deal only with the primary direct and indirect categories. More detailed estimates for secondary, or induced, employment will be presented at a later stage. With regard to the primary direct employment, the estimates are restricted to only those employment opportunities that will result from the construction and operation of the basic pipeline system that is

being proposed by Arctic Gas. Similarly, the indirect category is restricted to the development of only those field facilities and gas plants that would be required to achieve the pipeline base case throughput. In other words, the estimates ignore the potential for expanded activity in the producing end and with respect to the pipeline itself.

In addition, the estimates for pipeline employment -- the primary direct category -- do not include employment associated with the significant amount of post-construction clean-up and restoration that we anticipate will be contracted to outside firms during the first five years of pipeline operations. The estimates also do not include jobs that will be generated after the commencement of operations as a result of the expenditure of approximately half a million dollars annually on casual labour.

There are some additional conservative assumptions with respect to the indirect employment category that I will explain in a few moments when we turn to the numbers themselves. The effect of all of these factors is to introduce a downward bias in the estimates. In other words, the estimates are conservative if one is interested in the total number of employment opportunities. I think that the relevance of this conservative approach, for the purposes at this stage, will become clear. Later, when we get to the point of discussing potential population increases and other employment-related impacts, we will use estimates that have a reverse bias to ensure that such impacts are not understated.

Primary Direct Employment

The first table shows estimated man-years of employment in pipeline construction in Canada north of the 60th parallel. Assuming a start in 1977, construction employment will increase from an initial level of about 250 man-years to a peak in the third year of 2,500 man-years, and then decline to a level of about 650 man-years in 1983. While Mr. Williams will be presenting more detailed information on skill breakdowns, I should note that approximately 64% of the construction work force will be skilled, 16% semi-skilled, and 20% unskilled.

Although these estimates are presented in terms of man-years, they generally correspond to the estimates presented by Mr. Williams in an earlier phase of the hearings. I use the word generally because we have rounded the figures here to the nearest 50 for the sake of simplicity. Further, the conversion to man-years is not a straightforward one since it involves aggregating the data on a calendar year basis, as well as averaging to account for the peaking that will occur. In addition, the data presented here does not include the inspection personnel that were added in by Mr. Williams in his earlier presentation.

The man-year unit of measure was adopted in Section 14.c and has been retained here to simplify comparisons with other employment-related data. Before leaving this table, it is useful to consider the corresponding estimates of the number of men that would be

TABLE 1

PRIMARY DIRECT EMPLOYMENT IN STUDY REGION:
PIPELINE CONSTRUCTION

<u>Year</u>	<u>Man-Years</u>	<u>Season</u>	<u>No. of Men During Peak Work Periods</u>
1977	250	Summer 77	250
		Winter 77/78	500
1978	1,100	Summer 78	1,350
		Winter 78/79	3,800
1979	2,500	Summer 79	1,400
		Winter 79/80	4,550
1980	2,450	Summer 80	1,250
		Winter 80/81	4,200
1981	1,500	Summer 81	200
1982	800		
1983	650		

required during peak periods.

Because of the fluctuations that will occur as a result of construction scheduling, the estimates of the number of men required have been aggregated by season. The number of man-months for July, August, and September were averaged in order to get the estimates for the summer seasons, and man-months for January, February, and March were averaged to get the winter season estimates. Of course, employment is not restricted to only those 6 months. The intent here is simply to show the number of men required in the peak portion of the summer seasons and the peak portion of the winter season.

As you can see, the actual number of men required during a given season is larger than the man-year estimates might suggest. In the peak winter of 1979/80, the number of men required is in excess of 4,500, while the total man-year estimates for both 1979 and 1980 run in the order of 2,500.

The estimates of total man-years of employment in pipeline construction, shown in the previous table, are repeated in the first line of Table 2. The second line shows the estimated full-time employment in pipeline operations, rounded to the nearest ten. Operations employment begins in 1979 at a level of about 130 man-years and then increases in 1982 to a stable level of approximately 210 man-years per year.

TABLE 2

TOTAL DIRECT AND INDIRECT EMPLOYMENT IN THE STUDY REGION

(Man-Years)

Category of Employment	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Pipeline Construction	250	1,100	2,500	2,450	1,500	800	650				
Pipeline Operations			130	190	200	210	210	210	210	210	210
TOTAL DIRECT	250	1,100	2,630	2,640	1,700	1,010	860	210	210	210	210
Delta Gas Development and Production	600	1,450	1,500	1,750	1,450	1,250	1,300	650	650	650	650
Exploration	750	750	750	750	750	750	750	750	750	750	750
Transportation and Equipment Storage		550	550	550	550						
TOTAL INDIRECT	1,350	2,750	2,800	3,050	2,750	2,000	2,050	1,400	1,400	1,400	1,400
TOTAL DIRECT PLUS INDIRECT	1,600	3,850	5,430	5,690	4,450	3,010	2,910	1,610	1,610	1,610	1,610

You will recall that I mentioned that the employment estimates for the operating phase do not include the casual or part-time labour that will be required. Accordingly, unlike the case in construction, the man-year estimates for the operating phase correspond directly to the number of jobs.

As you know, the operating headquarters of the northern division of the pipeline will be in Inuvik. Inuvik will also serve, along with Norman Wells and Fort Simpson, as a district office for the operations and maintenance of a specific portion of the line. The ongoing operations employment will be split among these three centres, with Inuvik generating approximately 80 man-years per year, while Norman Wells and Fort Simpson each will account for approximately 65 man-years per year.

Adding the construction and operations phase estimates yields the estimate of total direct employment shown in the third line of the table.

The next portion of the table shows the indirect employment that will be generated as a result of gas field development, gas plant construction and operations, continuing exploration activities, and the increase in transportation and equipment storage and supply activity that will be generated by the pipeline and related construction. Again, the estimated man-years in each category have been rounded to the nearest 50.

As I noted earlier, the employment estimates for gas field development and production were derived by taking into account only the gas field activities required to support the base case pipeline system.

Bearing in mind that we are interested here in deriving estimates of only the employment that will result directly or indirectly from the pipeline, the estimation of exploration employment in the Delta and other sub-regions poses a more difficult problem. While it is probable that in the absence of the pipeline exploration activities would decline, it is not possible to estimate with any degree of certainty what the "without pipeline" levels of activity would be. The level of activity could fall to almost zero, depending on the nature of the decision that was made with respect to the pipeline. Alternatively, the level could decline for a period of time and then increase.

In view of the estimation difficulties, we used the following approach to derive the approximation shown in the table.

For the Delta sub-region, it was assumed that the estimated 1974 level of exploration activity will remain constant throughout the study period;

For the other sub-regions, it was assumed that the average level of activity in recent years will remain constant throughout the study period.

The total employment generated by these two assumed levels of activity has been attributed in the Table as an impact of the pipeline.

It is probable that the Delta assumption significantly understates what will actually occur as a result of the pipeline. While it is possible that the assumption for exploration activity in the other sub-regions may overstate somewhat the effects of the pipeline, this category does not account for a large proportion of the total and it is likely that the degree of understatement for the Delta more than compensates for any over-estimation in the other sub-regions. The net result, in our judgement, is that the figures shown reflect a conservative estimate of exploration employment attributable to the pipeline.

A similar situation arises in the estimation of employment in the transportation sector (the third category of indirect employment). A significant proportion of transportation activity has been generated by the petroleum industry in recent years, and therefore a decline could be anticipated in the absence of the pipeline. On the other hand, it is expected that there will be some increase in traffic as a result of the growth of the base population of the region, even without the pipeline. While it is probable that the net "without pipeline" situation would involve a decline in transportation activity, it is impossible to make a realistic estimate of the magnitude of the change. Accordingly, in estimating indirect employment attributable to the pipeline, we have again used a

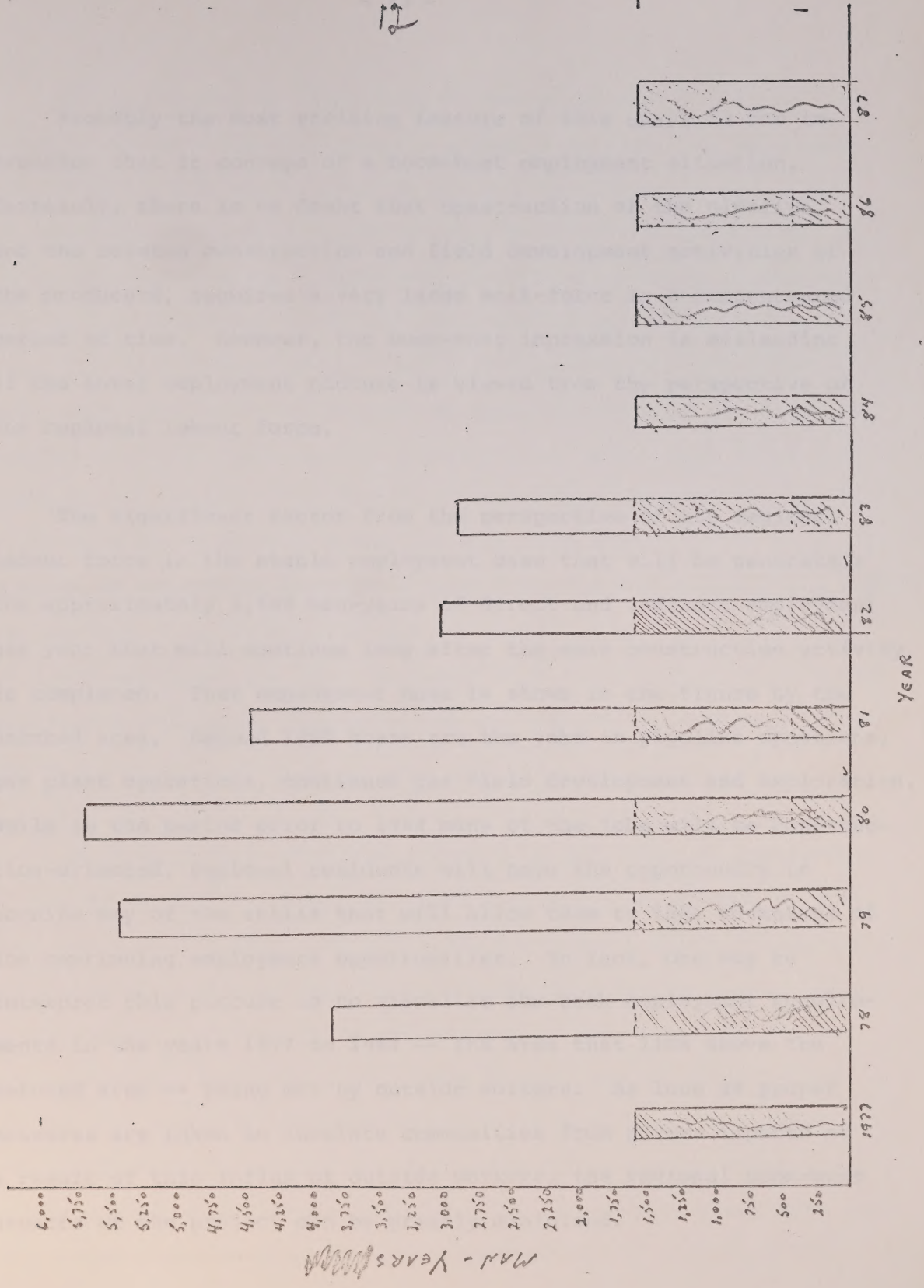
conservative approach: only the employment associated with anticipated increases in transportation activity above current levels has been attributed to the project. In other words, it has been assumed that any decline due to a decrease in petroleum industry activity in the absence of the pipeline would be matched by an increase in transportation activity as a result of the projected increase in the base population.

The annual totals for the three categories of indirect employment are shown in the second last line of the Table.

The last line shows the overall estimate of employment attributable to the project that results from summing the annual totals of direct and indirect employment. I should note that while the Table only covers the period to 1987, the post-construction level of approximately 1,600 man-years of employment per year represents a stable employment picture that would continue beyond 1987.

In Figure 1 we have depicted the totals from the last table in a simple bar chart form to provide a clearer picture of the pattern of direct and indirect employment through the period to 1987. The chart provides a picture of the year-to-year changes in total man-years of employment.

Figure 1
Total Direct and Indirect Employment in the
Study Region



Probably the most striking feature of this chart is the impression that it conveys of a boom-bust employment situation. Certainly, there is no doubt that construction of the pipeline, and the related construction and field development activities of the producers, requires a very large work-force in a concentrated period of time. However, the boom-bust impression is misleading if the total employment picture is viewed from the perspective of the regional labour force.

The significant factor from the perspective of the regional labour force is the stable employment base that will be generated: the approximately 1,600 man-years of direct and indirect employment per year that will continue long after the main construction activity is completed. That employment base is shown in the figure by the hatched area. Beyond 1984 these are the jobs in pipeline operations, gas plant operations, continued gas field development and exploration. While in the period prior to 1984 many of the jobs will be construction-oriented, regional residents will have the opportunity to acquire many of the skills that will allow them to take advantage of the continuing employment opportunities. In fact, one way to interpret this picture is to visualize the peak employment requirements in the years 1977 to 1984 -- the area that lies above the hatched area -- being met by outside workers. As long as proper measures are taken to insulate communities from adverse impacts as a result of this influx of outside workers, the regional boom-bust aspects of the project can be greatly minimized.

At this point, the relevance of the conservative estimation procedures that were described is probably evident. We have gone out of our way to ensure that we did not overstate the estimates of continuing employment opportunities that will be generated. In fact, not only are the estimates conservative in terms of the categories that have been dealt with, but they also exclude all secondary or spin-off employment effects of the project, as well as employment that would be associated with expansion of the producer activities or of the pipeline itself. At a later stage when we present more detailed information on secondary effects, it will be clear that the 1,600 man-years per year represents a minimum of continuing employment opportunities for regional residents. Having said that, however, I want to emphasize that even the level of 1,600 man-years per year is highly significant in relation to the prevailing employment situation and the size of the regional labour force.

In 1972, Gemini undertook a survey of the level of employment in the study region. They estimated that total employment in that year was equal to approximately 6,450 man-years. The 1,600 man-years of direct and indirect employment attributable to the project would be equivalent, therefore, to an increase of approximately 25% over the employment levels in 1972. This is only one of several yardsticks that could be employed to indicate that, for this region, the stable continuing employment opportunities will be highly significant and not at all indicative of a boom-bust situation, in the sense that that term is normally used.

With this overall employment picture as a backdrop, the other members of the panel will now present more detailed information regarding the nature of the jobs that will be available and the potential for regional residents to take advantage of the job opportunities should they choose to do so. They will also deal with policies and plans that Arctic Gas hopes to implement with respect to southern workers who will be employed in the north.

THE NATURE OF PIPELINE CONSTRUCTION

EMPLOYMENT OPPORTUNITIES

by

G.L. Williams

Presented to

Mackenzie Valley

Pipeline Inquiry

THE NATURE OF PIPELINE CONSTRUCTION

EMPLOYMENT OPPORTUNITIES

Mr. Commissioner, I am going to briefly review the nature of employment opportunities that will be available during the construction phase.

Detailed information on personnel requirements and skill classifications was filed in response to the Pipeline Application Assessment Group, Question # 2. In that response, crew sizes and job classifications were provided for the following:

- Typical Hand Clearing Crew
- Typical Machine Clearing and Right-of-Way Preparation Crew
- Typical Airfield and Station Site Crew
- Typical Construction Spread North of 65 degrees North Latitude
- Typical Construction Spread South of 65 degrees North Latitude

I propose to include essentially the same information here, with only a minor revision to reflect changes that have been made since the response was filed. Specifically, a revision has been made to the crew entitled "Typical Airfield and Station Site Crew". When the response was written, the crew required to construct compressor M-15 was selected as being typical. As a result of subsequent changes in the construction plan, that crew is no longer typical and we have therefore substituted a crew composition that is an average of all crews required to complete this phase of the project.

In addition, the information presented in the response has been augmented by the inclusion of two other significant crews -- the crews constructing the compressor stations after the gravel pad, airstrips, wharfs and roads are completed, and the crews required to install a major river crossing.

Each of the crews is broken down by skill classification. The classifications used here and in the filed response were suggested by the Economic Staff Group of the Northern Development Branch of DIAND in their report entitled Regional Impact of a Northern Gas Pipeline. The description of each skill class is as follows:

Class 1 Skilled pipeline workers with experience and/or qualifications gained through extended employment in the pipelining industry. Labour in this classification is a part of the pipeline industry and would all be imported.

Class 11 Labour in this classification is comprised essentially of skilled construction-oriented labour with highly developed skills which are not necessarily related specifically to pipeline construction. Experience or intensive training either prior to pipeline construction or on-the-job training would be required.

Class III Labour in this classification is defined as having some clerical or light equipment handling experience. On-the-job or prejob training would be required.

Class IV Labour in this classification is defined as having little or no previous experience related to service, construction or transportation functions, but will have previous work experience in formal employment.

The proportions of each classification deemed not to require extensive industry experience are:

0% of Skill Class I
10% of Skill Class II
100% of Skill Class III and IV.

The crew sizes and skill classifications are shown in Tables 1 through 7. It should be emphasized that the crews shown are typical of the total number of people required to complete the particular aspect of the project. It should not be interpreted, however, that all of the people listed would be required at the work site at the same time, or for the full duration of the project phase. In most cases, the camp facilities required would be for fewer people than the total shown for each crew.

TABLE 1

TYPICAL HAND CLEARING CREW

<u>Position</u>	<u>Skill Classification</u>				
<u>Title</u>	<u>Class 1</u>	<u>Class 11</u>	<u>Class 111</u>	<u>Class 1V</u>	<u>Total</u>
Equipment Operator		3			3
Heavy Duty Teamster		1			1
Power Saw Operator			10		10
Saw Filer			4		4
Common Labourer				8	8
Cook		1			1
Bull Cook				2	2
Foreman	<u> </u>	<u>1</u>	<u> </u>	<u> </u>	<u>1</u>
TOTALS	0	6	14	10	30

TABLE 2

TYPICAL MACHINE CLEARING AND RIGHT-OF-WAY PREPARATION CREW

<u>Position</u>	<u>Skill Classification</u>				
<u>Title</u>	<u>Class 1</u>	<u>Class 11</u>	<u>Class 111</u>	<u>Class 1V</u>	<u>Total</u>
Foreman		2			2
Skilled Labourer			10		10
Unskilled Labourer				6	6
Principal Equipment Operator		21			21
Apprentice Equipment Operator			2		2
Heavy Duty Teamster		6			6
Light Duty Teamster			2		2
Journeyman Welder		1			1
Welder Helper			1		1
Driller		1			1
Surveyor		1			1
Chainman			2		2
Cook		2			2
Bull Cook				4	4
Office Manager		1			1
Timekeeper			<u>1</u>		<u>1</u>
TOTALS	0	35	18	10	63

TABLE 3

TYPICAL AIRFIELD AND STATION SITE CREW

<u>Position</u>	<u>Skill Classification</u>				
<u>Title</u>	<u>Class 1</u>	<u>Class 11</u>	<u>Class 111</u>	<u>Class 1V</u>	<u>Total</u>
Earth Mover Operator		10			10
Crawler Tractor Operator		6			6
Motor Grader Operator		4			4
Wheeled Loader Operator		4			4
Crusher Operator		4			4
Rock Driller		4	4		8
Powderman		2			2
Common Labourer				7	7
Heavy Duty Mechanic		3			3
Serviceman			2		2
Welder		1			1
Superintendent		1			1
Rock Foreman		1			1
Grade Foreman		2			2
Crusher Foreman		1			1
Surveyor		1			1
Rodman			1		1
Chainman			1		1
Office Manager		1			1
Field Bookeeper		1			1
Timekeeper			1		1
Cook		2			2
Bull Cook				2	2
Camp Manager		1			1
TOTALS	0	49	9	9	67

TABLE 4

TYPICAL CONSTRUCTION SPREAD NORTH OF 65° NORTH LATITUDE

Position	Skill Classification				
Title	Class I	Class II	Class III	Class IV	Total
Foreman Labour	10	5			15
Skilled Labour			6		6
Unskilled Labour				6	6
Principal Equipment Operator	65	35			100
Apprentice Equipment Operator			29		29
App. Mech. and Serv.			2		2
Heavy Duty Teamster	15	35			50
Light Duty Teamster		11	27		38
Premium Welder	12				12
Welder Helper			93		93
Powderman		2			2
Electrician		3			3
Driller		4			4
Plumber		1			1
Carpenter		5			5
Dope Fireman		2			2
Paper Latcher			2		2
Graded App.			3		3
Buffer			4		4
Hooker			16		16
Swamper		10	25		35
Skidmen			12		12
Driller Helper				4	4
Common Labour				44	44
Heavy Duty Mechanic	4	3			7
Fuelman		4			4
Night Service		3			3
Intermediate Operator		10	3		13
Light Duty Mechanic		3			3
Road Service		2			2
Spotter		1			1
Plant Operator		8			8
Master Mechanic	1				1
Superintendent	1				1
Assist. Superintendent	1				1
Field Engineer	3				3
Assistant Engineer		1			1
Office Manager		1			1
Surveyor I.M.		2			2
Equip. Superintendent	1				1
Radio Operator		1			1
Radio Technician		1			1
Nursing Orderly/Aide		4			4
Pay Clerk		2			2
Cost Clerk		1			1
Timekeeper			3		3
Camp Superintendent		1			1
Camp Boss		1			1
Chairman			4		4
Warehouseman	2				2
Tireman		1			1
Yardman		2			2
Utility Welder		5			5
Stringer Welder	6				6
Hot Pass Welder	10				10
Journeyman Welder	1				1
Clampman	3				3
Stabber	1				1
Spacer	2				2
Backend Welder	50	10			60
Cook		11			11
Bull Cook				44	44
TOTALS	188	191	229	98	706

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TABLE 5

TYPICAL CONSTRUCTION SPREAD SOUTH OF 65° NORTH LATITUDE

Position Title	Skill Classification				
	Class I	Class II	Class III	Class IV	Total
Foreman Labour	10	3			13
Principal Eq. Operator	60	30			90
Apprentice Eq. Operator			28		28
App. Mech. & Serv.			2		2
Heavy Duty Teamster	10	27			37
Light Duty Teamster		10	26		36
Premium Welder	11				11
Welder Helper			94		94
Powderman		3			3
Electrician		3			3
Driller		5			5
Plumber		1			1
Carpenter		5			5
Dope Fireman		2			2
Paper Latcher			2		2
Graded Apprentice			3		3
Buffer			4		4
Hooker			16		16
Swamper		12	27		39
Skidmen			14		14
Driller Helper				5	5
Common Labour				44	44
Heavy Duty Mechanic	4	3			7
Fuelman		4			4
Night Service		4			4
Intermediate Operator		10	3		13
Light Duty Mechanic		3			3
Road Service		3			3
Spotter		1			1
Plant Operator		8			8
Master Mechanic	1				1
Superintendent	1				1
Assistant Superintendent	1				1
Field Engineer	3				3
Assistant Engineer		1			1
Office Manager		1			1
Surveyor I.M.		2			2
Equipm Supervisor	1				1
Radio Operator		1			1
Radio Technician		1			1
Nursing Orderly/Aide		4			4
Pay Clerk		2			2
Cost Clerk		1			1
Timekeeper			3		3
Camp Supervisor		1			1
Camp Boss		1			1
Chairman			4		4
Pickup Driver			3		3
Warehouseman	2				2
Tireman		2			2
Yardman		2			2
Utility Welder		5			5
Stringer Welder	6				6
Hot Pass Welder	12				12
Journeyman Welder	1				1
Clamman	3				3
Stabber	1				1
Spacer	2				2
Backend Welder	50	10			60
Cooks		10			10
Bull Cooks				42	42
TOTALS	179	181	229	91	680

TABLE 6

TYPICAL COMPRESSOR STATION CONSTRUCTION CREW

<u>Position</u>	<u>Skill Classification</u>				
<u>Title</u>	<u>Class I</u>	<u>Class II</u>	<u>Class III</u>	<u>Class IV</u>	<u>Total</u>
Superintendent	1				1
Assistant Superintendent	1				1
Office Manager	1				1
Clerk			1		1
Engineers	2				2
First Aid		1			1
General Foreman	6				6
Craft Foreman		21			21
Pipefitters & Welders	75				75
Operating Engineers	4				4
Carpenters		24			24
Cement Masons		6			6
Millwrights		6			6
Ironworkers		12			12
Boiler Makers		4			4
Electricians		25			25
Cooks			4		4
Insulators			18		18
Painters			15		15
Labourers				16	16
Bull Cooks				8	8
TOTALS	90	99	38	24	251

The number of compressor station construction crews required by construction season are:

<u>Construction Season</u>	<u>Stations Under Construction</u>
Summer 4	4
Winter 5	4
Summer 5	10 (4 completed, 6 started)
Winter 6	6
Summer 6	10 (6 completed, 4 started)
Winter 7	4
Summer 7	10 (4 completed, 6 started)
Winter 8	6
Summer 8	6 (6 completed)

TABLE 7

TYPICAL RIVER CROSSING INSTALLATION CREW

<u>Position</u> <u>Title</u>	<u>Skill Classification</u>				<u>Total</u>
	<u>Class I</u>	<u>Class II</u>	<u>Class III</u>	<u>Class IV</u>	
Superintendent	1				1
Assistant Superintendent	1				1
Office Manager	1				1
Timekeepers			2		2
Clerk			1		1
Aidmen		2			2
Mechanics		3			3
Helpers			3		3
Fuelman				1	1
Engineer	1				1
Rodmen			2		2
Pilot	1				1
Flight Engineer	1				1
Welder Foreman	1				1
Welders	20				20
Welders Helpers			20		20
Spacers		2			2
Clampmen		2			2
Coating Foreman					1
Batch Plant Operator			1		1
Mixer Operator			1		1
Loader Operator			1		1
Form Installers				12	12
Boom Operators	6				6
Dozer Operators		4			4
Backhoe Operators	4				4
Oilers			8		8
Unskilled				12	12
Cooks			6		6
Bull Cooks				14	14
Barge Captain	1				1
Chief Engineer	1				1
Mates	2				2
Assistant Engineers	2				2
Welders	2				2
Helpers			2		2
Deckhands				8	8
Boss Hands			2		2
Mechanics		4			4
Oilers			2		2
Electricians		4			4
Donkeymen			4		4
Levy Crew				20	20
Levy Foremen			2		2
TOTALS	46	21	57	67	191

I should note that the typical major river crossing crew shown in Table 7 would be adequate to install the crossings at the East and Langly Mackenzie River Channels in the summer of construction year 4. Smaller crews would be used for the installation of the Great Bear crossing, and the Mackenzie River crossing near Fort Simpson. This typical crew would be augmented with additional equipment and personnel to install the crossings of Shallow Bay, West Channel and Middle Channel during the summer of construction year 5.

Table 8 shows the present estimate of the number of crews that would be required in each construction season. This estimate, which is based on the schedule shown in the Consolidated Filing, reflects a slight change from the information filed in response to Question #2. The changes result from the adoption of the Cross Delta Routing, the movement of facilities away from communities, and the possible non-availability of the Mackenzie Highway north of Wrigley.

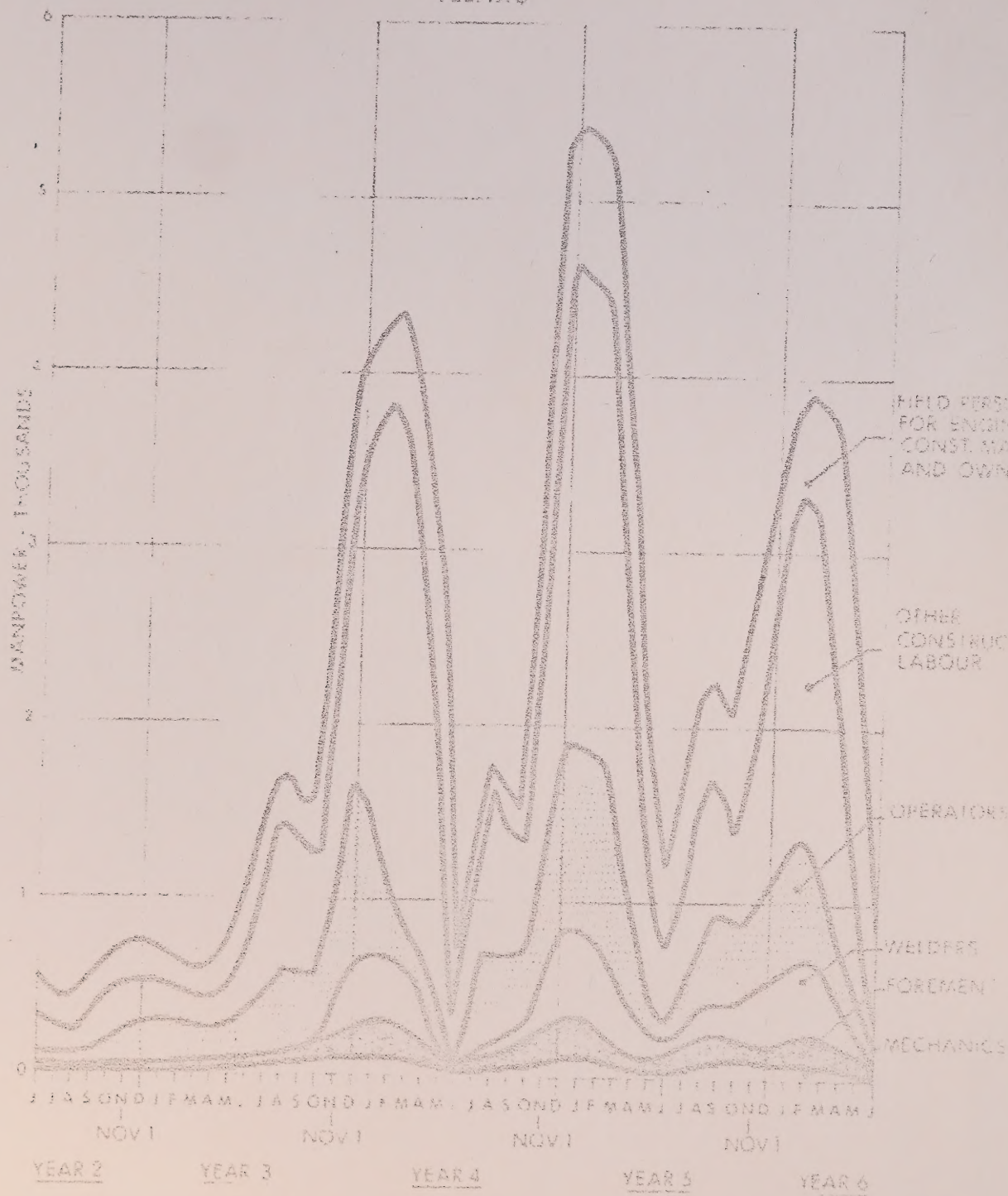
Figure 1 shows the accumulative labour requirements in Canada, North of 60°. This graph is a revised version of the graph presented earlier in the hearings, and takes account of the changes that result from adoption of the Cross Delta Routing.

TABLE 8
TYPICAL CREW REQUIREMENT

Construction Year	2	3	4	5	6	7	8		
Construction Season	W	S	W	S	W	S	W	S	
Hand Clearing			2	2					
Machine Clearing		2	3						
Airfield & Station Prep.	1	3	12	7	10	3	8		
Spreads North of 65°			3	3	3				
Spreads South of 65°			2	3					
Compressor Station Const.			4	4	10	6	10	6	6
River Crossing Install			3	1					

Note: W - Winter
S - Summer

FIGURE 1
LABOUR REQUIREMENTS NORTH OF 60°- INITIAL CONSTRUCTION
FEB. 1976



EMPLOYMENT POLICIES AND PROGRAMS

PIPELINE CONSTRUCTION

by

F. T. HOLLANDS

Presented to

Mackenzie Valley
Pipeline Inquiry

EMPLOYMENT POLICIES AND PROGRAMS

PIPELINE CONSTRUCTION

I NORTHERN RESIDENTS

Mr. Commissioner, this testimony deals with the development of programs for employment opportunities for northern residents during the construction phase. In addressing this question, Arctic Gas recognizes a special obligation to the native peoples of the North.

Arctic Gas has established a continuing dialogue with the various parties who would logically have an interest in the successful development of a northern residents employment program. These include DIAND, trade unions which will be involved, as well as some of the execution contractors who may be involved. In addition, Arctic Gas has tried to benefit from the experiences of the Alyeska project in Alaska where a somewhat similar situation provides an opportunity for meaningful observation.

The Alyeska Project Agreement contains certain provisions about training and employment of Alaskan residents and Arctic Gas has continuously observed and studied the implementation of these provisions.

We have had discussions with Alyeska, with contractors, with unions and with Alaskan State Government personnel concerned with employment opportunities, and as a result, Arctic Gas is in a position to learn from the Alaska experience and to use this learning to ensure that its policies about employment for northern residents are realistic and at the same time consistent with policies established in the "Expanded Guidelines for Northern Pipelines, 1972".

As the client, Arctic Gas can clearly impose conditions on the contractors with respect to employment, training, counselling and working conditions during construction. This, of course, is not enough. It will be necessary to have the cooperation and active support of all the trade unions involved -- particularly with respect to matters such as union membership, use of hiring halls, and entrance standards for trades training of northern residents. It is well recognized that these are matters of great importance to the individual unions in the construction industry.

I believe the obligations of Arctic Gas, the execution contractors and the unions which would be involved in the project should be the same, insofar as employment and training of northern residents are concerned, and therefore it is expected that all parties will be seeking to reach agreement on these matters in a manner which will be consistent with the policies as established in the "Expanded Guidelines for Northern Pipelines, 1972".

Arctic Gas has had under discussion with DIAND for two years the development of possible arrangements with respect to the employment and training of northern residents in both construction and operations.

The latest draft agreement which has been used for the purposes of discussion is appended to this testimony. Also appended is a letter from Mr. Arthur Kroeger, Deputy Minister of DIAND expressing their position with respect to this draft agreement.

While the draft has been used for the purposes of discussions, it is in no way final, and it is intended that any final arrangement reflect the input of this Inquiry and benefit from the views of all interested parties.

Meetings have also been held with representatives of the Pipeline Advisory Council. This Council consists of representatives of the four Pipeline Craft Unions (U.A., Labourers, Operating Engineering and Teamsters) and a number of pipeline contractors. The purpose of these meetings has been to exchange views and information and to seek the appropriate commitments so as to maximize the employment opportunities for northern residents during the construction phase.

It is my view that both the contractors and the pipeline craft unions represented on the Council understand the situation and they have given us assurances that they accept the principle of providing maximum employment opportunities to northern residents including reasonable relaxation of terms and conditions leading to such employment.

Arctic Gas has not held formal meetings with native organizations for the purposes of discussing the training and employment of interested northern natives during the construction phase, but is prepared to as soon as they wish to do so.

There have been informal meetings with some officials of some native organizations to discuss these questions, and there have been personal contacts with many northern residents in the settlements by both Nortran recruiters and Arctic Gas personnel.

Arctic Gas does not pretend to have settled all of the questions or to have reached all of the agreements necessary to assure a smooth integration into the construction employment stream of northern residents who are interested in getting employment during the construction phase.

Notwithstanding this ongoing process, Arctic Gas has formulated policies and has developed some of the plans necessary for the implementation of these policies.

Arctic Gas will give preference to all employable northern residents, who are desirous of construction employment in accordance with the "Expanded Guidelines for Northern Pipelines, 1972".

A policy of preference for northerners requires special measures. The special measures which will be made available by Arctic Gas are as follows:

- 1) In situations in which qualifications of a northerner and southern resident are equal, the northern resident will be given preference;
- 2) In any case where the qualifications of a particular job can be relaxed, we will do so for the northern resident and then give him preference over a fully-qualified southerner for that job;
- 3) In those cases where a candidate cannot meet the relaxed qualifications, special training will be made available to bring skills up to a level satisfactory for employment.

It is our view that these measures with respect to preference will result in employment opportunities for every northern resident who seeks such opportunity. But more important, is the focus on training and the consequent opportunity for northern residents.

The various unions involved have long and well-established standards for entry which without some modification would preclude the employment of many northern residents in skilled jobs. Two of the standards which will likely create difficulty for northern residents would be membership and dispatch through hiring halls.

I am of the view that the unions involved are aware of, and have a concern to solve these and other associated problems, and that the unions are prepared to make reasonable special accommodations for northern residents so as to ease the conditions for union membership and for employment through hiring halls.

The constitutions of the various unions and their practices dictate who will become union members. Arctic Gas will attempt to negotiate exceptions to these limitations so as to make union membership generally available.

Obviously, this is a prerequisite to one of the measures I identified earlier with respect to preference for northern residents.

Arctic Gas will provide information on all construction jobs. This information will be provided continuously to whatever government agency is designated to coordinate northern job placement.

At the present time, DIAND in conjunction with the territorial governments and several petroleum companies and gas transmission companies, including Arctic Gas, have under discussion a coordinated recruitment procedure for northern residents, which is called the Manpower Delivery System.

My concept of this system would include a "coordinating council" with representation from the government agency(s) responsible for employment, the unions involved in the project, native organizations interested in employment of their people, and of course, employers including Arctic Gas. This council would direct the overall activity of the Manpower Delivery System.

The essential elements of the system would include recruitment and selection procedures, travel and accommodation arrangements, medical examinations, clothing and equipment checks, union enrollment as required, pre-employment training where required, orientation, and personal and family counselling. Other elements may be identified as discussions and developments proceed.

It is our expectation that this system will eliminate the use of hiring halls in the north.

The measures that I have just described are examples of the concrete and practical steps that Arctic Gas intends to take either by itself or in conjunction with others in order to ensure that all northern residents capable of employment would have maximum opportunity to gain employment during the construction phase of the Arctic Gas project.

Arctic Gas will ensure that employment opportunities are made available to present and expanded numbers of Nortran trainees. Such employment will accommodate their continued development as operating and maintenance personnel when the pipeline enters the operating phase.

A number of problems are apparent when developing plans for the current Nortran trainees to progress to employment in the Operating and Maintenance phase of the pipeline. Mr. Virtue has discussed Nortran's plans to deal with these. Arctic Gas is in full agreement with these programs.

Arctic Gas will ensure that all northern residents employed in pipeline construction will enjoy benefits and privileges in respect to all employment matters equal to those accorded employees who are not residents and are employed in similar positions.

While much of the pipeline construction will be seasonal, with the bulk of the work being carried out between November and April, significant activities will continue throughout the year in construction and construction related activities at such facilities as wharves, stations, and support facilities. Current planning for pipeline construction as a whole has contemplated continuous employment from the seasonal commencement of construction into December with a rotational leave break at Christmas. The second half of the schedule might commence after the Christmas break, and continue through to closing of construction for the season in April or early May.

Once northern residents have been hired, Arctic Gas will be flexible in establishing construction work schedules for northern residents in order that community and personal requirements can be taken into account.

In practice this means that we will make available a variety of rotation schedules for northern residents.

Every attempt would be made to employ northern residents on sections of the pipeline as close to their home communities as possible.

Arctic Gas will arrange transportation for northern resident employees to their home communities on regular or chartered flights for scheduled rotational leaves, and will attempt to arrange the rotational leave schedules in a manner which would maximize the use of the aircraft. The Company's obligations in respect to the provision of transportation for a northerner will not exceed the cost associated with transporting a southerner out on rotational leave.

In addition to the normal indoctrination process, Arctic Gas will ensure that employed northern residents will be provided orientation on matters associated with wage employment. Further it is intended to offer a counselling service on an ongoing basis during construction with emphasis on the needs of employed northern residents.

Orientation will include discussion and instruction in matters such as:

- camp life
- fundamentals
- environmental concerns
- safety
- fire training
- basic first aid procedures
- money handling
- motor vehicle driver education when appropriate

The Nortran experience has clearly indicated the value and necessity of counselling during employment. Arctic Gas will adopt measures to attract northern residents who have had industrial work experience and exposure to work with southern workers and southern management with a view to using such people as counsellors. Such people, after training, would act as counsellors for northern residents, in both work related and social matters as well as providing communication and coordination between management and northern workers.

Mr. Commissioner, I want to reiterate that all these policies and programs I have discussed require the agreement of unions and contractors, and that Arctic Gas is not in a position to single-handedly assure their implementation. In addition, it goes without saying that it would be desirable to have the full cooperation and involvement of the native organizations.

II SOUTHERN WORKERS

Having completed my testimony with respect to the provision of employment opportunities to northern residents during pipeline construction, I would now like to deal with policies and plans, that are relevant to this Inquiry with respect to southern employees who will be working in the north.

- 1) Arctic Gas will attempt to ensure in cooperation with the unions and contractors that no persons other than northern residents will be accepted for employment should they apply at any location north of the 60th parallel.

Arctic Gas intends to give the widest possible publicity to this policy in order to avoid people coming into the Northwest Territories and the Yukon Territory in the hope of obtaining employment.

- 2) Arctic Gas will, in cooperation and with the participation of the contractors and unions involved, have all indoctrination for persons hired in the south carried out at centres in southern Canada.

The process of indoctrination would involve, amongst other things, travel and accommodation arrangements, medical examination, clothing and equipment checks, union enrollment.

- 3) Where pre-employment training is required by a southern hire, this will be done to the greatest extent possible in the south.
- 4) All southern hires will be given orientation and safety, fire and survival training at the construction site.

Orientation would include such things as, camp life and camp rules. Special emphasis will also be given to an orientation program for southern hires designed to familiarize them with the northern lifestyle and culture and with an understanding of northern people. This orientation would be handled by a northern counsellor.

- 5) Arctic Gas will provide training and familiarization programs for all southern personnel with respect to special northern environmental hazards and with respect to the policies of the Company and the applicable Governmental regulations designed to protect the environment.

THIS AGREEMENT made as of the day of , 197

BETWEEN:

HER MAJESTY THE QUEEN in right of Canada
as represented by the Minister, Department
of Indian Affairs and Northern Development
(hereinafter called "her Majesty"),

- and -

CANADIAN ARCTIC GAS PIPELINE LIMITED
a body corporate incorporated under the
laws of Canada with Head Office at the
City of Toronto in the Province of Ontario
(herein called the "Company").

WHEREAS on March 21, 1974 the Company made an application
to the Minister of Indian Affairs and Northern Development to acquire
a right-of-way and other interests in lands located in the Northwest
Territories and the Yukon Territory for the purpose of constructing,
operating and maintaining a gas transmission pipeline; and

WHEREAS Her Majesty desires to ensure, to the maximum extent
practicable, the employment of residents of the territories -- and
particularly native people, in the construction, operation and maintenance
of the portion of the pipeline located in the Northwest Territories and
the Yukon Territory; and

WHEREAS the Company understands the spirit of the "Expanded Guidelines for Northern Pipelines, 1972" issued by Her Majesty, and in order to achieve the aforesaid objectives of Her Majesty, proposes to develop and institute a practical plan for the preferential hiring training and promotion of northern residents.

NOW THEREFORE in consideration of the premises and of the covenants and agreements herein, the parties agree as follows:

SECTION ONE

INTERPRETATION

1.1 Definitions

In this agreement, unless there is something in the subject matter or context inconsistent therewith:

- (1) "Agreement" means this agreement and its schedules and all agreements supplemental hereto;
- (2) "Canada Manpower" means the Department of Manpower and Immigration;
- (3) "Commissioner" means the Commissioner of the Yukon or of the Northwest Territories, as the context requires, or anyone authorized to act on his behalf;

- (4) "Construction Period" means that portion of the Term of this Agreement commencing on the date when the Company first receives from the National Energy Board the Certificate of Public Convenience and Necessity and the last of all other government authorizations and requisite approvals necessary to construct the pipeline, and ending on the date which the National Energy Board grants leave to the Company to open the pipeline;
- (5) "contractor" means any person, firm, or corporation with whom the Company has contracted any part of the work;
- (6) "counsellor" means an officer appointed by the Commissioner to provide information, guidance and assistance to northern residents in respect to training, job orientation, working and living conditions and social adjustment;
- (7) "Minister" means the Minister of Indian Affairs and Northern Development;
- (8) "northern resident" means.....
- (There are many interpretations of "northern resident", which are used or proposed for use. It is such an important matter in determining preferential objectives in employment and training that it was agreed to defer finalization until completion of the Inquiry)

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- (9) "employable northern resident" means a northern resident who is willing and capable of performing work in one of the construction or operating and maintenance pipeline categories, is willing to accept employment at locations remote from his home settlement as required, and is willing and able to comply with all of the Company's safety and other work rules, regulations and operating procedures;
- (10) "Operations Period" means that portion of the Term of this Agreement commencing at the completion of The Construction Period and ending upon the last day of the term of this agreement made between Her Majesty and the Company and dated _____, granting to the Company the interests in certain lands in the territories required for the pipeline;
- (11) "permanent and continuous position" means a position that is required to be filled on a regular basis;
- (12) "pipeline" means that portion of the natural gas pipeline constructed by the Company pursuant to the authorization of a certificate issued by the National Energy Board on those lands in the territories in which Her Majesty granted an interest to the Company;

- (13) "regular employment" means the employment of an employee of the Company who is eligible for all employee benefits and usually requires that he be employed 52 weeks of the year;
- (14) "project officer" means an officer of the territorial government appointed by the Commissioner as a senior field representative for the purposes outlined in this Agreement;
- (15) "Term of this Agreement" means the period of time commencing on (date of execution of this agreement) and ending upon the completion of the Operations Period;
- (16) "territorial government" means the Government of the Northwest Territories and of the Yukon Territory, or either of them, as the context required;
- (17) "territories" means the Northwest Territories and the Yukon Territory;
- (18) "trainee" means a northern resident designated by Canada Manpower or a project officer and accepted by the Company or a contractor in a training position; and
- (19) "work" means any activity undertaken along the right-of-way and other locations in the territories for the purpose of constructing, maintaining or operating the pipeline and ancillary facilities in the territories.

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1.2 Extended Meanings

Words importing the singular number include the plural, and vice versa, and words importing the masculine include the feminine gender.

1.3 Interpretation Not Affected by Headings

The division of this Agreement into sections and the insertion of headings are for convenience of reference only and shall not affect the construction or interpretation of this Agreement.

1.4 Entire Agreement

This Agreement constitutes the entire agreement between the parties as to the subject matter hereof, and except as stated and in the instruments and documents referred to or to be executed and delivered pursuant hereto, contains all of the representations, undertakings and agreements of the parties.

SECTION TWO

TRAINING, CONSTRUCTION and OPERATIONS

2.1 Training

The Company will use the services and facilities of the territorial government and the Department of Manpower and Immigration to the maximum extent practicable for training northern residents. The Company will provide on-the-job training as required and will cooperate with the territorial government and the Department of Manpower and Immigration to assure co-ordination of the programs of the Company, the Department of Manpower and Immigration, and the territorial government. The training will be designed to qualify trainees to hold positions in the construction, operations and maintenance of the pipeline consistent with the objectives stated in the Northern Development Policy 1971-81 with the objectives outlined in subsection 2.3.

2.2 Construction Period

(1) During the Construction Period, the Company will ensure that all contractors will seek to employ employable northern residents at all levels and, in doing so, will make the maximum use of the facilities of the Department of Manpower and Immigration, and without limiting the generality of the foregoing the Company will ensure that:

- (a) all contractors are conversant with, accept the principles of, and undertake to operate within the "Expanded Guidelines for Northern Pipelines, 1972";

- (b) all contractors will provide, on a continuous basis, Canada Manpower with advance information on all of their workforce requirements so that northern residents can be identified and referred for employment consideration;
- (c) all contractors will, at agreed intervals, provide the project officer with a roster of employees, with their job classifications, identifying the northern residents;
- (d) all contractors will, whenever possible, give the project officer prior notice of its termination of the employment of any northern resident. Where the termination is a result of the contractor's initiative, it must be able to demonstrate to the satisfaction of the project officer that such action was necessary; and
- (e) all contractors will provide on-the-job training, where such training is necessary, for initial employment of employable northern residents and for their development of skills for advancement. Certain training on-the-job programs already established by the Department of Manpower and Immigration and/or the territorial government will be available to the contractors.

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(2) During the Construction Period, the Company must show just cause to the project officer if employable northern residents are not offered employment. The Company will co-operate with the counsellors and Canada Manpower to provide, prior to the commencement of the Construction Period, information, guidance and assistance to northern residents in respect of job possibilities, training, job orientation, working and living conditions, and social adjustment.

2.3 Operations Period

(1) During the Operations Period, the Company expects to have a requirement for 200 or more permanent and continuous positions in the territories. The Company accepts a long-term goal of filling all positions with employable northern residents, and to this end will co-operate with government in training northern residents to qualify for these positions. The Company accepts a goal of ensuring that within four years after the commencement of the Operations Period, the Company will have provided regular employment to employable northern residents equal to at least 40% of the total pipeline positions in the territories.

(2) During the Operations Period, the Company will ensure that all contractors will seek to employ employable northern residents at all levels and, in doing so, will make the maximum use of the facilities of the Department of Manpower and Immigration, and without limiting the generality of the foregoing the Company will ensure that:

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- (a) all contractors are conversant with, accept the principles of, and undertake to operate within the "Expanded Guidelines for Northern Pipelines, 1972";
 - (b) all contractors will provide, on a continuous basis, Canada Manpower with advance information on all of their workforce requirements so that northern residents can be identified and referred for employment consideration;
 - (c) all contractors will, at agreed intervals, provide the project officer with a roster of employees, with their job classifications, identifying the northern residents;
 - (d) all contractors will, whenever possible, give the project officer prior notice of its termination of the employment of any northern resident. Where the termination is a result of the contractor's initiative, it must be able to demonstrate to the satisfaction of the project officer that such action was necessary; and
 - (e) all contractors will provide on-the-job training, where such training is necessary, for initial employment of employable northern residents and for their development of skills for advancement. Certain training on-the-job programs already established by the Department of Manpower and Immigration and/or the territorial government will be available to the contractors.

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2.4 Designation of Positions

It shall be the exclusive responsibility of the Company to determine and designate the number and types of positions that will be required by the Company and the contractors during the Construction Period and the Operations Period.

2.5 Unavailability of Northern Residents

Nothing herein shall prohibit or restrict the Company or any of its contractors from filling positions with persons other than northern residents in instances where employable northern residents are not available through referral by Canada Manpower or other recruiting means.

2.6 Benefits

During the Term of this Agreement, the Company shall ensure that all northern residents employed by the Company, will enjoy equal benefits and privileges in respect to transportation, accommodation, and shift rotation, with Company employees who are not northern residents and are employed in similar pipeline positions. A reasonable maximum cost of transportation per employee will be established by the Company and shall apply to all employees.

SECTION THREE

GENERAL

3.1 Forecasts and Evaluation

Within one month of the commencement of the Term of this Agreement and every three months thereafter, the Company will provide to the Minister a forecast of labour requirements for the Construction Period and Operations Period by anticipated number, occupation, seasonal requirements and locations. At the Minister's request, the Company will meet with the Minister to evaluate progress being made towards the requirements set out in subsection 2.3 in light of such factors as employee turnover, career development and innovative employment practices.

3.2 Advices by the Minister

To achieve effective and prompt communication between the Company and government officials appointed for the purposes of this agreement, the Minister shall notify the Company on a current basis of the identity and office of the Commissioner, counsellors and project officer as well as of the names of all persons authorized to act on their behalf. The Minister shall give the Company notice at least 5 clear days in advance of any meeting initiated by the Minister relating to this agreement and shall designate in the notice the time, place and agenda for the meeting.

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3.3 Performance Indemnification

(a) Prior to the commencement of the construction period, the Company will have completed negotiations with the Minister in respect of performance indemnification relative to terms and conditions of land use permits and related authorizations for the construction and operation of the pipeline. Such procedures aforesaid as are agreed to between the parties will have application to this agreement to assure performance by the Company of its obligations hereunder.

(b) The Company will cooperate with any monitoring personnel (excluding the Minister, the Commissioner, counsellors and project officers) designated by the Minister to ensure compliance by the Company and the Company's contractors with the obligations assumed with respect to the Construction Period by the Company under this Agreement.

3.4 Successors and Assigns

This Agreement shall be binding upon and shall enure to benefit of the successors and assigns of the parties hereto, provided that the Company may not assign its interest in this Agreement without the prior written consent of the Minister.

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3.5 Notice

All notices and communications hereunder shall be in writing, and in lieu of personal service may be given or made by prepaid telegram or by registered air mail, postage prepaid, addressed to the parties at the addresses listed below. Notices or communications so sent shall be deemed to have been received twelve (12) hours after the sending thereof in the case of a telegram and forty-eight (48) hours after the date of mailing in the case of mailing, in either case excluding Saturdays, Sundays and statutory holidays. Until changes by a party hereto by notice, the addresses for the parties are:

(a) Her Majesty

The Minister
Department of Indian Affairs
and Northern Development
Centennial Tower
400 Laurier Avenue West
Ottawa, Ontario
K1A 0H4

(b) Canadian Arctic Gas
Pipeline Limited

1270 Calgary House
550 - 6th Avenue S. W.
Calgary, Alberta
T2P 0S2

Attention: _____

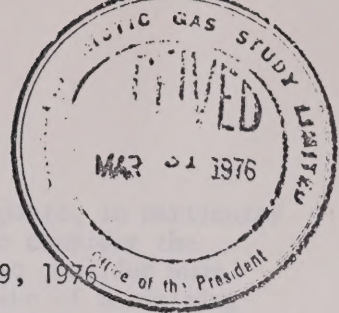
3.6 Benefit to Other Parties

No member of the House of Commons, the Council of the Northwest Territories or the Council of the Yukon Territory may be admitted to any share or part of this Agreement or to any benefit to arise therefrom.

IN WITNESS WHEREOF the parties hereto have duly executed this Agreement as of the day and year first above written.

The Minister, Department of Indian
Affairs and Northern Development

Canadian Arctic Gas Pipeline Limited



Mr. V. Horte,
President,
Canadian Arctic Gas Limited,
P.O. Box 139,
Commerce Court Postal Station,
Toronto, Ontario M5L 1E2.

March 29, 1976

Dear Mr. Horte:

Following our meeting on Thursday, March 18, I thought it would be useful if I confirmed to you in writing our views on the subject of training and employment for native people in connection with Arctic Gas' pipeline project.

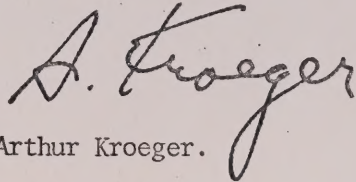
As you know, a major concern of the Government and the department is to ensure that any northern pipeline yields maximum benefits to native northerners. To this end, discussions about a training and employment agreement have been held between our officers. Several alternate drafts have been developed during the course of these discussions, but no final conclusions have been reached to date. It has been recognized by both sides that our examination of the subject was necessarily provisional in view of the expectation that Mr. Justice Berger would be making a number of recommendations in this area. We have also been conscious of the need to obtain the views of native representatives, perhaps initially through Mr. Justice Berger, but also through direct discussions at an appropriate stage.

At our meeting, we discussed your company's forthcoming appearance before the Berger Inquiry. Naturally, it will be for you to decide how best to structure your presentation. From our point of view, however, I can confirm that there would be no objection to your including the most recent draft of the training and employment agreement as part of your prepared evidence which must be

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circulated in advance. This would permit participants, in particular the native organizations, to have adequate time to consider the principles on which the draft has been based and to consider what changes might be made so that our ultimate objective of maximizing native participation in the project, should it go ahead, can be realized. I can also confirm that there would be no objection to your making a copy of this letter available to the Inquiry if you should consider it desirable to do so.

Yours sincerely,

A handwritten signature in cursive script, reading "A. Kroeger". The signature is written in dark ink and is positioned above the printed name.

Arthur Kroeger.

THE NATURE OF
PIPELINE OPERATIONS AND MAINTENANCE
EMPLOYMENT OPPORTUNITIES

by

M. E. CARLSON

Presented to

Mackenzie Valley
Pipeline Inquiry

THE NATURE OF
PIPELINE OPERATIONS AND MAINTENANCE
EMPLOYMENT OPPORTUNITIES

While the Operation and Maintenance Concepts of the Arctic Gas Project were discussed in detail at an earlier phase of these hearings, I would like to briefly review some of the activities that constitute routine Operations and Maintenance tasks. This will provide background on the important aspects of a natural gas pipeline operation as it relates to the nature of employment opportunities in the operations and maintenance phase.

The Northern Division will be operated from a Divisional Headquarters at Inuvik and three District Headquarters within the Division at Inuvik, Norman Wells and Fort Simpson.

In order to achieve a safe, efficient and reliable operation of our pipeline facilities, two factors are of paramount importance:

- 1) Detailed operating procedures must be completed to cover every aspect of our field operation before the pipeline facilities are placed into service.

- 2) A comprehensive preventive maintenance program must also be prepared in advance so that we can operate the pipeline facilities at a peak efficiency with a minimum of unscheduled outages of our equipment.

I will expand upon these two important points so that you will have a better understanding of our Operations & Maintenance responsibility.

OPERATING PROCEDURES:

Operating procedures for every piece of equipment in our pipeline system will be prepared by our Operations & Maintenance Headquarters Staff that will be based in Calgary. These detailed procedures will be based on:

- a) Arctic Gas Operating Policies ;
- b) Existing regulations and codes which cover the natural gas industry ;
- c) Technical information made available by the manufacturers of the equipment.

These procedures will be supplemented by all of the technical documents necessary to convey to our Operations and Maintenance field staff our specific requirements in order to achieve a safe, efficient and reliable operation of our pipeline facilities.

Compressor station facilities, for example, will have procedures prepared which will cover the starting, operation, and shut down of all gas compressor and refrigeration equipment. Similarly procedures will be prepared to cover all other aspects of station operation such as:

- a) Use and operation of all fire fighting equipment;
- b) Inspection and calibration of instrumentation;
- c) Inspection and testing of safety devices;
- d) Repair, maintenance, and overhaul of equipment.

Also, a number of procedures will be prepared for pipeline operation. Included in this group would be procedures to cover emergency conditions, corrosion control, repair of leaks, right-of-way maintenance and stabilization.

Gas Measurement procedures will include instructions for the monitoring of gas movement through the pipeline. Since the measurement must be calibrated periodically to comply with applicable standards and regulations our procedures will cover in detail the method of inspection and calibration of this equipment.

As mentioned previously, operating procedures will be prepared to cover every aspect of our operation. These are necessary not only to convey our approved operating policies and practices to our field staff, but to also ensure that our operation complies with Canadian Gas System Codes and Regulations.

PREVENTIVE MAINTENANCE PROGRAM:

Whereas our operating procedures will indicate how each task is to be performed, our Preventive Maintenance Programs will define in detail the frequency of all aspects of preventive maintenance. In this regard our natural gas pipeline operations & maintenance function is not unlike what is in effect at other industrial installations such as refineries, chemical plants, power generating plants, etc. Pumps, motors, compressors, engines, heat exchangers, gauges, valves, buildings, heavy equipment, etc, all require preventive maintenance on a regular basis to ensure a reliable operation.

You will recall our compressor stations are being designed for a remote control unattended operation. This concept will require additional monitoring equipment built into the design so that our operating staff will be able to monitor & identify potential operating problems before they occur.

In a completely attended compressor station operation Preventive Maintenance Programs are scheduled on a Daily, Weekly, Monthly, Quarterly, Semi-Annually and Annual Basis. In our proposed unattended operation the only difference with regard to preventive maintenance activities would be the work items that would be in the category of daily maintenance. The frequency of these daily work items would probably be reduced to 2 or 3 times weekly after we make the transition from attended to unattended operation. I would expect this transition might take 1 to 2 years after we commence operation of our initial compressor station facilities.

It is important to note that although our station facilities will be designed for an unattended remote control operation, they will be visited at least 2 or 3 times each week by O & M personnel who will be carrying out the tasks specified in our preventive maintenance programs.

The following is a listing of a few examples of the type of work items that are involved in preventive maintenance programs for compressor station equipment:

Each Station Inspection: (2 or 3 times weekly)

- inspect plant thoroughly for oil & gas leaks
- check oil levels
- monitor and investigate unusual noise levels in piping and auxiliary equipment using portable vibration equipment
- observe recording and indicating instrument readouts
- inspect lube and hydraulic oil cooler operation

Weekly Work Items

- check operation of temperature recorders and monitors
- inspect and service gas starters
- check operation of plant vibration equipment to ensure same is fully operational and in calibration
- check out plant fuel gas charts and perform instrumentation maintenance as required
- inspect and service foam fire systems
- service all water treating facilities

Monthly Work Items

- service, inspection and calibration of plant flow instrumentation
- test and calibrate temperatures alarms and shut down devices
- inventory lube and hydraulic oil

Quarterly Work Items

- service, inspection and calibration check on plant vibration and speed monitors
- service and check calibration of ice detectors

Semi-Annual Work Items

- conduct boroscope inspection of gas generator and power turbine
- inspect and service plenum chamber and components within including starter, anti-icing and wash facilities

Annual Work Items

- inspect and service all plant check valves, regulating valves and relief valves
- inspect and service fuel gas filter
- inspect and service lube oil cooler

The above noted preventive maintenance items represent only a small fraction of the tasks that are routinely handled by O & M personnel on a pre-determined regular basis at typical gas compressor stations. Similarly, preventive maintenance will be scheduled for all other pipeline facilities.

In addition O & M personnel will be involved in minor and major overhauls of gas compressor equipment on a regular basis usually as specified by the equipment manufacturer.

This brief description of our operating procedures and preventive maintenance programs leads to a couple of additional observations about our proposed operation.

First of all most of the routine activities take place at compressor stations, measurement stations or along the right-of-way remote from the District Headquarters. As a consequence while all of our Northern Division employees are attached to specific Headquarters locations many of them will spend the major portion of their work schedule away from these central locations.

The second factor that is implicit to what I have described is the extent to which many of these important activities can be described as routine and the expertise in performing these tasks is developed by on the job exposure as opposed to formal educational qualifications. Although educational and other qualifications are important the history of our

industry has demonstrated quite clearly that the lack of these ideal qualification has not been an insurmountable detriment to promotion within our industry. In recent years, however, as technology has become more sophisticated the employee who is lacking some of the basic educational qualifications finds it more of a problem in advancing to more responsible positions.

I would now like to describe the specific numbers and types of positions that will be available in the northern division. (Viewgraph Table 2.1.2D 13.6)

As you can see the Northern Division Headquarters has a permanent staff of 9 located at Inuvik. The Division Manager and his staff have the responsibility for the entire operation of this Division. Three District Superintendents as listed on this chart report to the Division Superintendent. The left hand column identifies the various personnel that will be based at each of the District Headquarters. This chart also identifies the build up of personnel for each District for the first five years of operation. You will notice the totals in the right hand column for the Northern Division indicate a build up of personnel from 124 employees to a total of 206 for the 5th year of operation.

I will now discuss the positions listed for each District as identified in the left hand column.

District Superintendent - has the responsibility for the operations and maintenance of all of the pipeline facilities within the geographical limits of his District.

District Engineer - is the senior technical man in the District. His responsibilities include all technical aspects of the operation within the District as they apply to the compressor stations, measurement stations, pipeline and environment.

Pilot - this responsibility is self-explanatory.

Flight Engineer - maintains the aircraft in the District locations.

Clerical Staff - have duties which relate to Administration, material control, etc.

Maintenance Supervisor - reports to the District Engineer and is responsible for all preventive maintenance activities within the District.

Foreman - reports to the Maintenance Supervisor and is in charge of individual maintenance projects.

Mechanic - is generally responsible for maintaining and repairing heavy work equipment.

Operator - operates heavy work equipment such as backhoes, bulldozers and low ground pressure vehicles etc.

Welder - these men are qualified pipeline welders whose skills are maintained at a high level of efficiency in case their expertise is required for emergency repairs.

Maintenance Man - Most of the new hires start in at this position. With experience and additional training the maintenance men eventually can be promoted to other positions in the field operation.

Chief Technician - is the senior technician in the District.

Technician - Several technician catagories are covered by this position. These include communications, controls, mechanical, gas mesurer and corrosion. These men all report to the Chief Technician.

One point that can be noted from this brief description of the various positions is the extent to which construction will provide training and experience that is relevant to the acquisition of permanent Operating & Maintenance jobs. In addition of course many of the Nortran trainees are currently gaining training and experience in these operating jobs on southern pipelines.

NORTHERN DIVISION HEADQUARTER

Division Manager
Administration, Personnel,
Safety & Training
Engineering, Technical, Env
Lands & Right-of-Way
Clerical

PERSONNEL

	INUVIK DISTRICT (221 miles of pipe-1st Yr.) (399 miles of pipe-2nd Yr.)					NORMAN WELLS (308 miles of Years of Ope				
	Years of Operation					Years of Ope				
	1	2	3	4	5	1	2	3		
District Superintendent	1	1	1	1	1	1	1	1	1	
District Engineer	1	1	1	1	1	1	1	1	1	
Pilot	2	2	2	2	2	1	1	1	1	
Flight Engineer	2	2	2	2	2	1	1	1	1	
Clerical	4	4	4	4	4	4	4	4	4	
Maintenance Supervisor	1	1	1	1	1	1	1	1	1	
Foreman	1	2	2	2	2	1	1	1	1	
Mechanic	2	4	4	4	4	2	4	4	4	
Operator	3	6	6	6	6	2	4	4	4	
Welder	2	3	3	3	3	2	3	3	3	
Maintenance Man	8	12	12	12	12	6	8	8	8	
Chief Technician	1	1	1	1	1	1	1	1	1	
Technician	15	27	30	33	33	12	27	30		
Total Personnel	43	66	69	72	72	35	57	60		
Stations in Operation	1	3	5	6	6	2	4	5		

FIVE-YEAR PERSONNEL REQ
FOR THE NORTHERN DIVI
INUVIK DISTRICT, NORMAN WELLS DISTRICT A

TABLE 2.1.2D

EMPLOYMENT POLICIES AND PROGRAMS
PIPELINE OPERATIONS AND MAINTENANCE

by

F. T. HOLLANDS

Presented to
Mackenzie Valley
Pipeline Inquiry

EMPLOYMENT POLICIES AND PROGRAMS

PIPELINE OPERATIONS AND MAINTENANCE

Mr. Commissioner, I would now like to discuss operations phase employment in terms of the opportunities it offers various groups of employees. In particular, I will outline the situation as we see it affecting northern residents. This cannot be done in isolation if we are to be realistic and acknowledge the existence of problems likely to be encountered in attaining northern employment objectives for the operations and maintenance phase. We can be fairly accurate as to the number and kinds of jobs required to operate and maintain the pipeline as discussed by Mr. Carlson earlier. What is highly uncertain is the degree to which northern residents will be available for, or interested in employment. This requires a concurrent look at the employment of southerners in the initial phase of operations and maintenance.

While the "Expanded Guidelines" impose obligations on Arctic Gas with respect to the employment of northerners, the overall objectives of efficiency and economy in operating the pipeline would be best served by having all positions filled by northern residents. In this context we view as a major problem, the fact there will be competition for resident labour by other projects, companies and government agencies.

Further, there will be an enticement for northern students to cut their education to accept construction jobs -- some of which will offer high rates of pay for relatively low skill level requirements.

If we do experience difficulty in attracting northern residents with desired levels of academic qualifications, we can accept lower educational standards at the entry level than has been the case in the south. However, we must recognize that this could be a deterrent to advancement to more senior levels in the company.

Recognizing that the foregoing could affect our ability to meet our objectives, we can nevertheless outline Arctic Gas' intentions with respect to hiring and training policies; intended orientation and counselling procedures; and plans for work schedules and residency requirements.

There are some areas related to employment in operations and maintenance similar to, if not identical to, those reviewed earlier in the construction phase. Specifically I am referring to the Company's intention to continue orientation and counselling programs, and to the commitment to ensure that all northern residents employed are accorded comparable treatment to southerners employed in similar positions. Therefore it is not intended to deal with these in detail.

1. Hiring Policy

During the operations and maintenance phase of the pipeline, Arctic Gas will seek to preferentially employ employable northern residents. Arctic Gas will provide for a recruitment and selection function to be carried out in the District Offices in Inuvik, Norman Wells and Fort Simpson.

The services of Canada Manpower and N.W.T.

Employment Division will be utilized to bring the job opportunities to the attention of persons in communities at some distances from the District Offices. This will provide all those northern residents who desire the opportunity of regular employment access to job vacancies for which they might qualify.

For seasonal and casual labour required on company maintenance programs, local residents will be given the first opportunity of employment.

To ensure that continuing efforts for both regular and casual hires of northerners are maintained, Arctic Gas will co-operate with governments in arranging training which will prepare local residents for such employment opportunities. In addition, Arctic Gas will encourage vocational programs related to the industry at the high school level and in the technical trades programs at A.V.T.C. Fort Smith.

2. Training Programs

An important consideration for Arctic Gas will be to ensure that the current NORTRAN trainees have the opportunity for jobs in operations and maintenance on the pipeline in the north, and access to further training and development as required. Training opportunities for northern residents desiring employment with Arctic Gas will be maintained, with the long-term objective of staffing the operations and maintenance department in the north with northern people. Continuing training efforts will be maintained for all personnel in areas such as firefighting, safety and first aid, survival and vehicle operating.

Arctic Gas will cooperate with government agencies to ensure that northern residents are provided the opportunity of academic upgrading when required, prior to skill training and employment in operations and maintenance.

Northern residents, when employed by Arctic Gas, will be provided with orientation programs designed to acquaint them with work habits and lifestyles of other workers in the company and the industry, and the opportunities and responsibilities associated with a wage economy.

Arctic Gas will also make available counselling for northern employees and their families to help them adapt to the requirements of wage employment.

For southern workers assigned to the N.W.T. and the Yukon, Arctic Gas will provide orientation programs designed to familiarize them with northern culture and an understanding of northern people.

Arctic Gas will provide training and familiarization to all northern personnel in regard to environmental hazards and government regulations for protecting the environment.

In addition to those training plans noted previously, it will be necessary for Arctic Gas to arrange special programs designed to train technicians. This training will provide for on-the-job training, specialized training conducted by equipment vendors, and related theory sessions at government training institutions. In particular, I should emphasize that the Canadian Gas Association has for many years offered a correspondence course in basic course natural gas transmission with emphasis on maintenance and operations. We will encourage participation in this program.

Manpower requirements for operations and maintenance must be coordinated with these special programs to provide orderly progress from training to employment. Northerners will be given the opportunity to participate in these special programs.

3. Considerations with respect to Northern Lifestyle

Arctic Gas has stated many times its intention of according equal treatment to all employees regarding conditions of work and company benefits. We have further stated our intention of giving preference to northerners when hiring for jobs in the north. Consistent with these two stated positions, Arctic Gas intends to provide employment flexibility and counselling for northern employees, in order to assist those northern residents who desire to make a transition from their present lifestyle to accommodate involvement in a wage economy.

The following illustrates the type of flexible policies we believe will be helpful to northern employees -- particularly at start-up of operations.

- a) Arctic Gas will provide jobs for operations and maintenance personnel desirous of a mixed lifestyle in which pursuit of employment in a wage economy and continuation of traditional occupational pursuits related to the family and community can be accommodated.

- b) A transportation policy which would provide benefits to northerners who choose to live in communities in N.W.T., and Yukon other than District Headquarters, comparable to those benefits provided southern employees who may commute and rotate on work schedules to an established southern location.
- c) Innovative and flexible payroll arrangements, designed to meet the needs of the individual and his family. Encouragement and assistance in ways and means to increase the propensity to save and invest for the long term benefits possible in a wage economy.

4. Work Schedules and Residency

The employment objective of Arctic Gas is to man all the pipeline district locations in a manner similar to that employed in existing large gas transmission pipelines -- that is to have a stable work force consisting of employees at all job levels who make their permanent homes reasonably close to the work place.

This may not be practical at time of start-up for a number of reasons. Some of the reasons are related to considerations of community growth and development, which will be dealt with by a later panel. What I will deal with here are things that appear to influence the demand and supply of qualified persons to fill the jobs available, and the degree to which individual preferences about residency and work schedules can be accommodated.

We have said that Arctic Gas will have in excess of 200 permanent and continuous positions in pipeline operations and maintenance north of 60°. We have also accepted a long term goal of filling all positions north of 60° with northern residents, and to this end will cooperate with government in training northern residents to qualify for these positions.

It is our opinion that it will require several years for new hires in the industry to aspire to the senior positions at the Division level. This is true of any one who is employed and inexperienced in pipeline operations. It may be more difficult for northerners due to cultural background, traditional lifestyle and lack of familiarity with a wage oriented society. A second factor influencing the attainment of a "normal" operation is the willingness of the employee to make his permanent residence in one of the three district office locations.

A third factor referred to earlier will be the degree to which we can attract larger numbers of northern residents to a "special" training program to supplement those who will have been trained in NORTRAN and prepared to go north again.

It is considered opinion of Arctic Gas that we will have to establish our work schedules for permanent and continuous positions to accommodate four kinds of employees at start-up and for some time into the future.

- To start up any major installation requires highly qualified personnel at all skill levels from technician to management. Some will come from existing pipeline companies on loan; some will come as permanent employees from other pipelines and related industry. It is highly probable that most of the latter group would prefer to maintain a permanent residence in a southern location such as Edmonton and rotate on a work schedule similar to that presently used in the exploration operations in the north.

In the initial operations stages, rotation appears to be a preferable arrangement insofar as the company is concerned. In fact, the company would require a rotational arrangement for loanees whose term of employment would probably not exceed two years.

- A second group of employees filling permanent and continuous positions will be northern residents who have been trained under NORTRAN or who are direct hires, and who prefer to maintain their permanent residence in their home community, and rotate on the same work schedule established for southern hires. There may be a few who wish to rotate, and whose home community is remote. In such cases it might be practical to establish a more extended work schedule, as previously discussed.
- A third group of employees filling permanent and continuous positions will be those who would prefer to make their home in one of the district office communities and for whom housing will be made available.
- A fourth small senior management group of employees, will be required to make their home in one of the district office communities from the commencement of employment.

Arctic Gas has not studied work schedules in any depth at this time, but intends to have concluded studies indicating the range of possibilities before operations commence. The ultimate mix of the four groups of employees at time of start-up will substantially influence the degree of flexibility attainable in the work schedules.

In conclusion, Mr. Commissioner, I would like to emphasize Arctic Gas' belief in, and support of NORTRAN. This program has the solid support of all seven participating companies, and probably offers for the present, the best solution to integration of employable northern residents into employment in the petroleum and natural gas industry. To a major degree, our ability to fulfill commitments I have been outlining depends on a recruitment, selection and training organization like NORTRAN.

